

# ***OFFICE OF NAVAL RESEARCH***



## **VIRTUAL AT SEA TRAINING (VAST)**

**National Defense Industrial Association  
7<sup>th</sup> Annual Artillery Symposium  
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# **VIRTUAL AT SEA TRAINING**

**Project VAST emerged from necessity to find a technological solution to readiness problem posed by reduction in naval training ranges.**

**While meeting this objective, it became clear that embedded, Virtual Reality-enhanced training represents a new paradigm that could resolve problems with current operational training:**

- (1) Degradation in readiness over the IDTC due to:**
  - Erosion of individual/team skills with time**
  - Dilution of crew/team skills due to turnover of personnel**
- (2) Expense and scheduling availability of training ranges**

**VAST represents a paradigm shift in operational training that transcends the immediate problem of training ranges.**



# Required Capabilities for Virtual At-Sea Training System



**X: Full capability**  
**P: Partial Capability**

Warfare Training Capability Provided	Live-Fire Range	Prototype VAST <sup>1</sup>	Surface VAST	Aviation VAST	USW VAST	Cum VAST
NSFS Live Fire Training	X	X	X			X
Support FXP-5 Qualifications	X	P	X			X
Air-Ground Ordnance Delivery	X			X		X
Coordinated surface, air and artillery fires	X			P		P
Amphibious landing with supporting live fire	X					
Combined exercises with allies	X			P		P
Co-located underwater warfare range	X				X	X
Use of sea-based high-altitude flight profiles	X			X		X
Low-traffic air space	X			X		X
Explosive Ordnance Disposal training	X					
Training of USMC Forward Observers	X	X	X	X		X
Training of Fire Coordination Teams	X	X	X	X		X
Day-night training capability	X		X		X	X
Portability for en route training & mission rehearsal		X	X	X	X	X

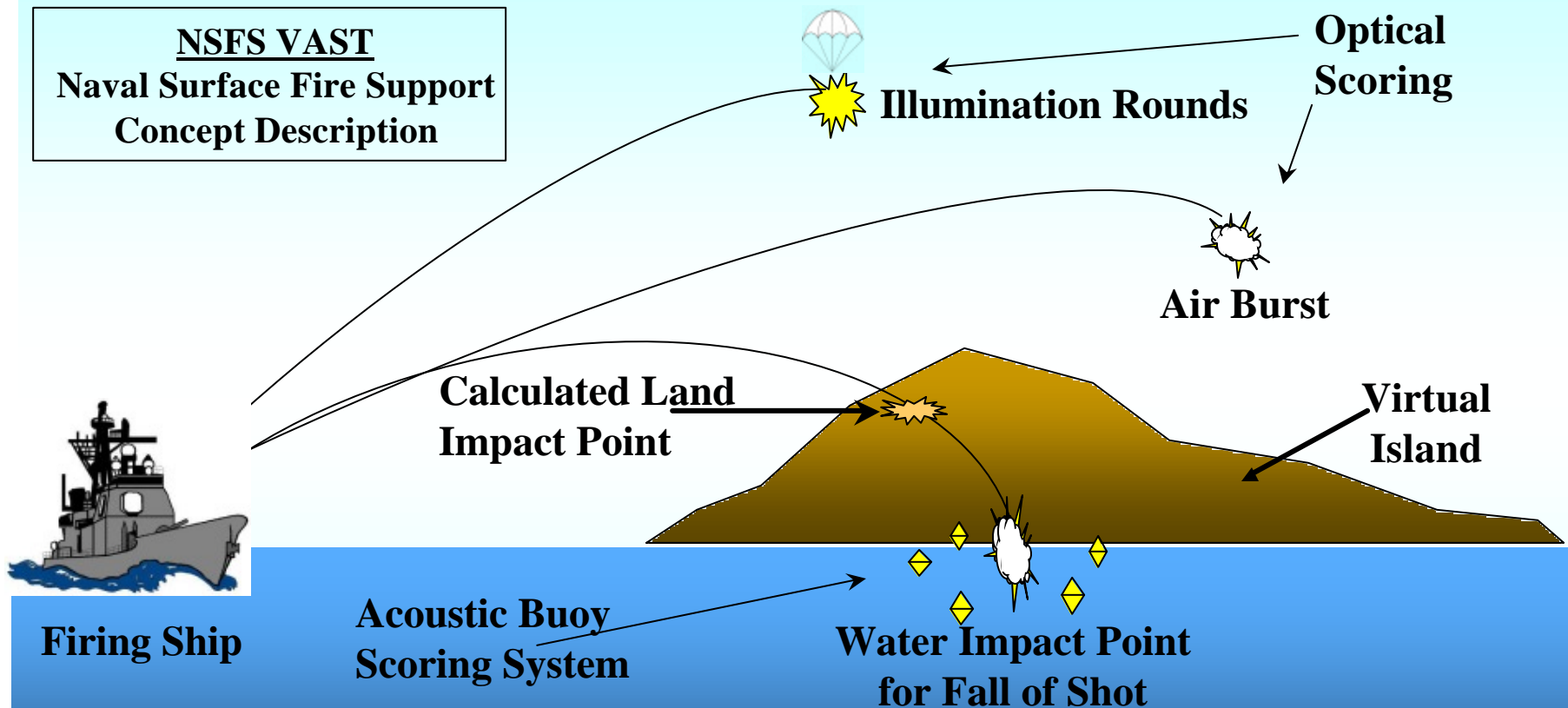
<sup>1</sup>To be deployed  
October 02

# NSFS VAST System

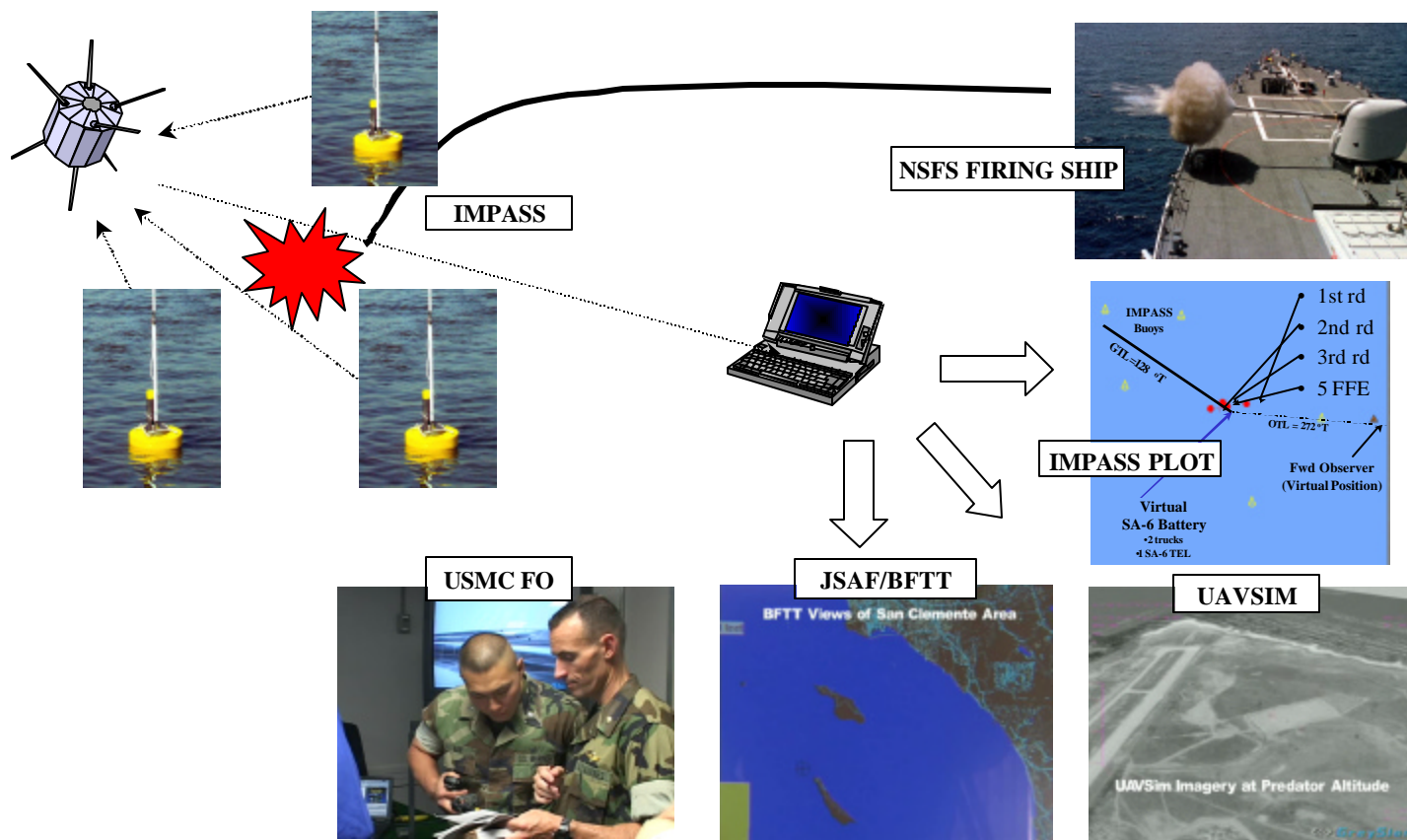
(NAVAL SURFACE FIRE SUPPORT)

## NSFS VAST

Naval Surface Fire Support  
Concept Description



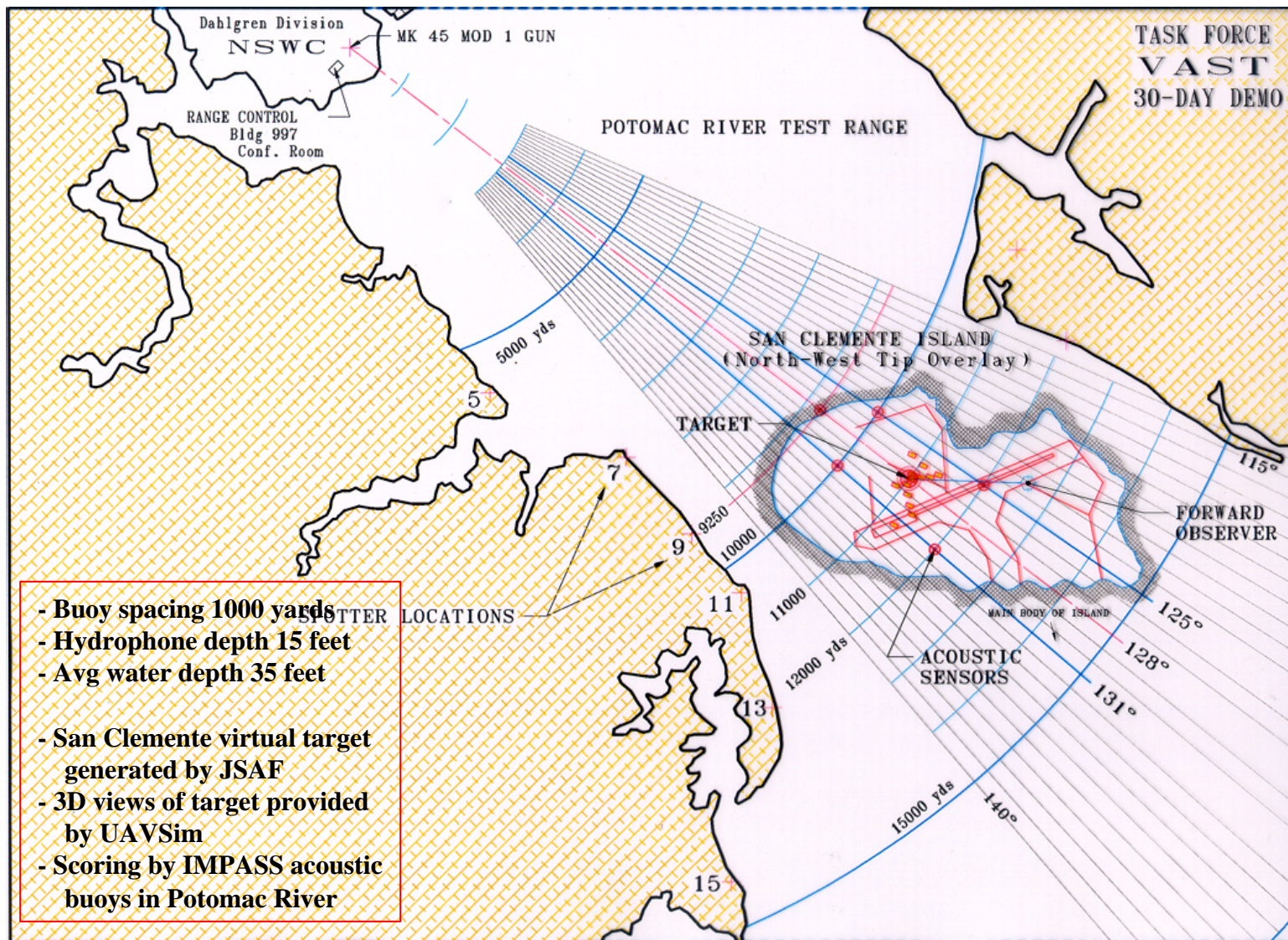
# NSFS VAST Concept



**An acoustic buoy-based, ship-deployed, sailor-operable training system for qualifying ship's crews and USMC forward observers in Naval Surface Fire Support that is fully compatible with the already deployed Battle Force Tactical Trainer (BFTT)**



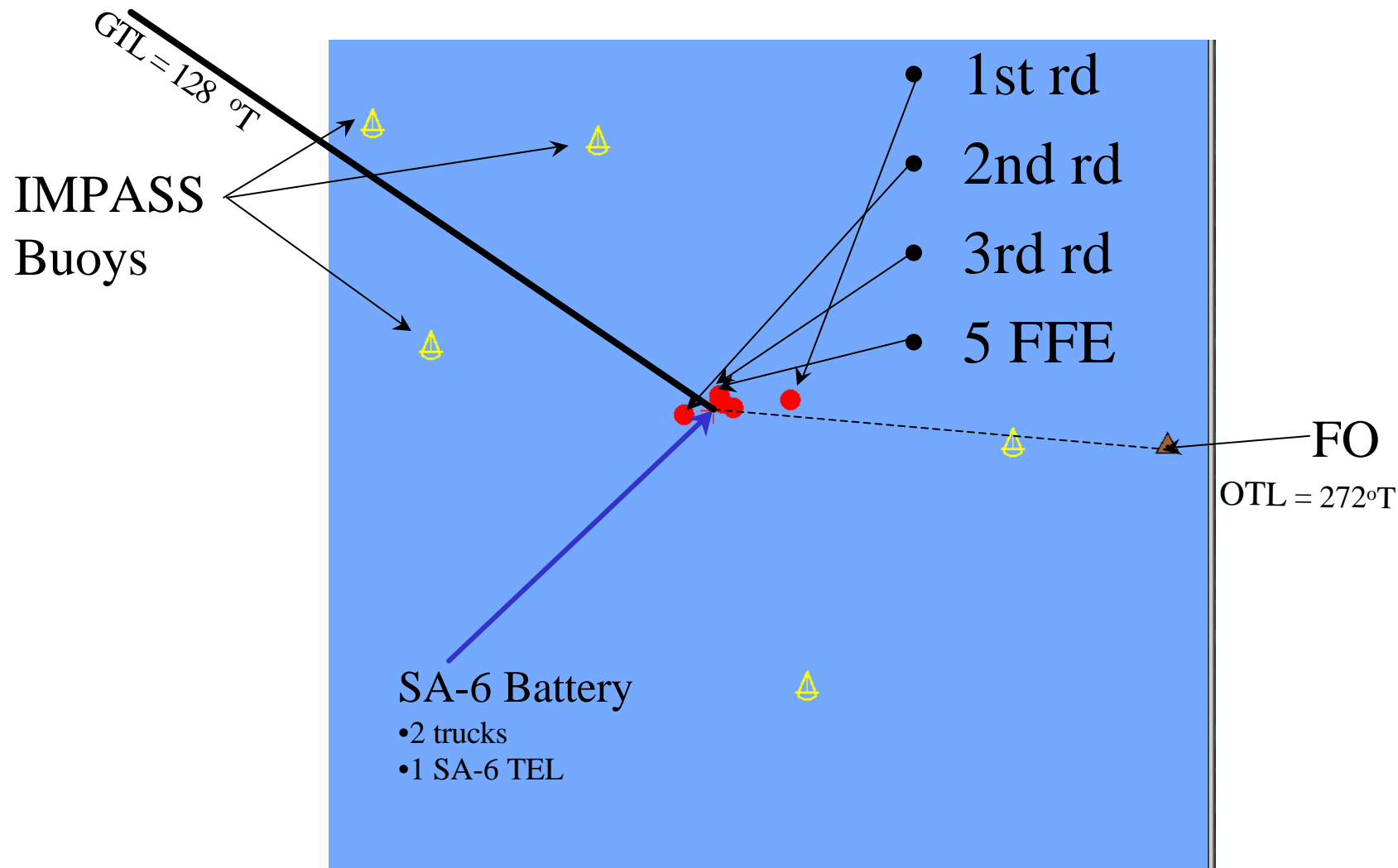
# Potomac River Range & San Clemente Overlay



# Forward Observer's Viewpoint

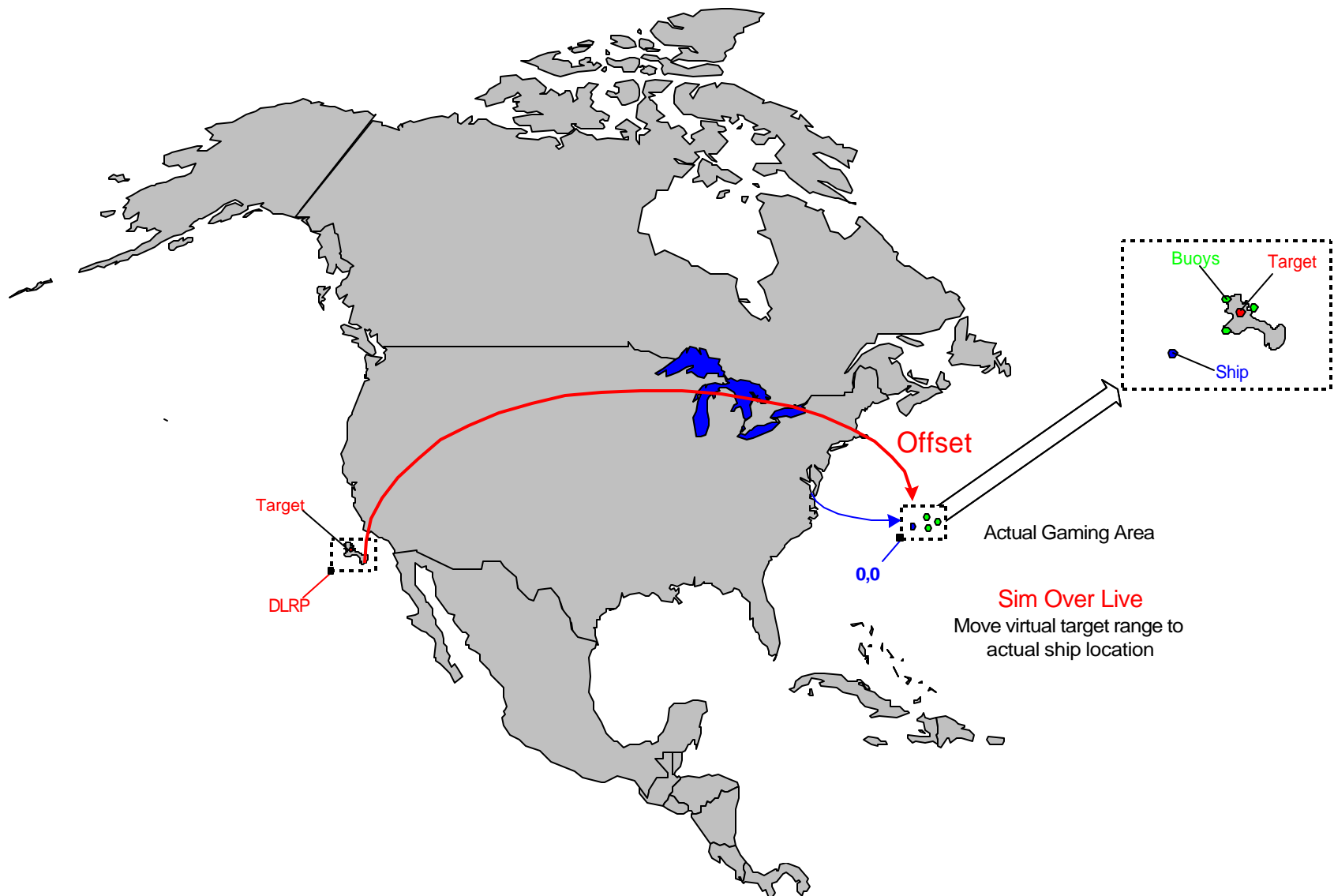


# Spotting of completed Fire Mission

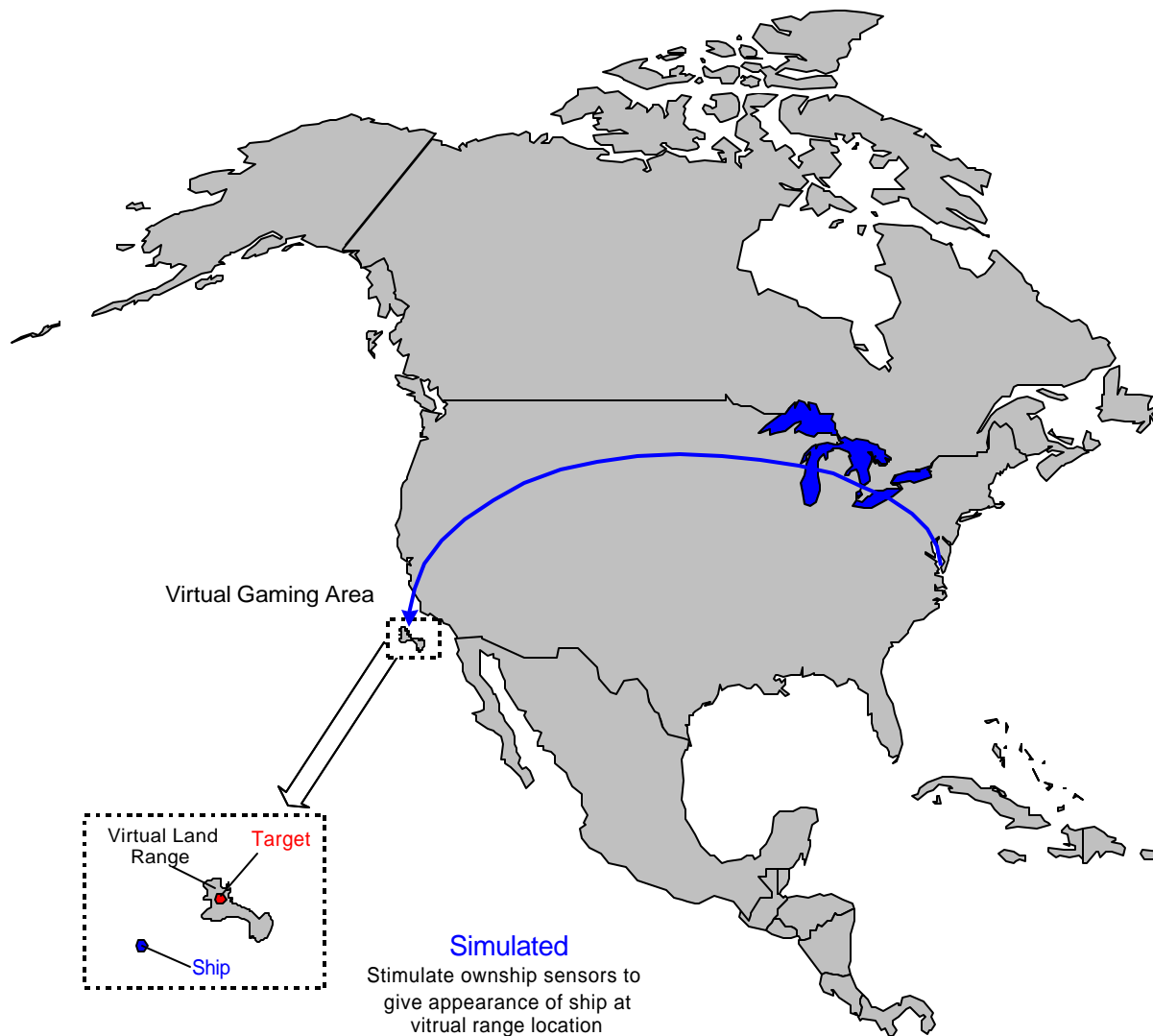




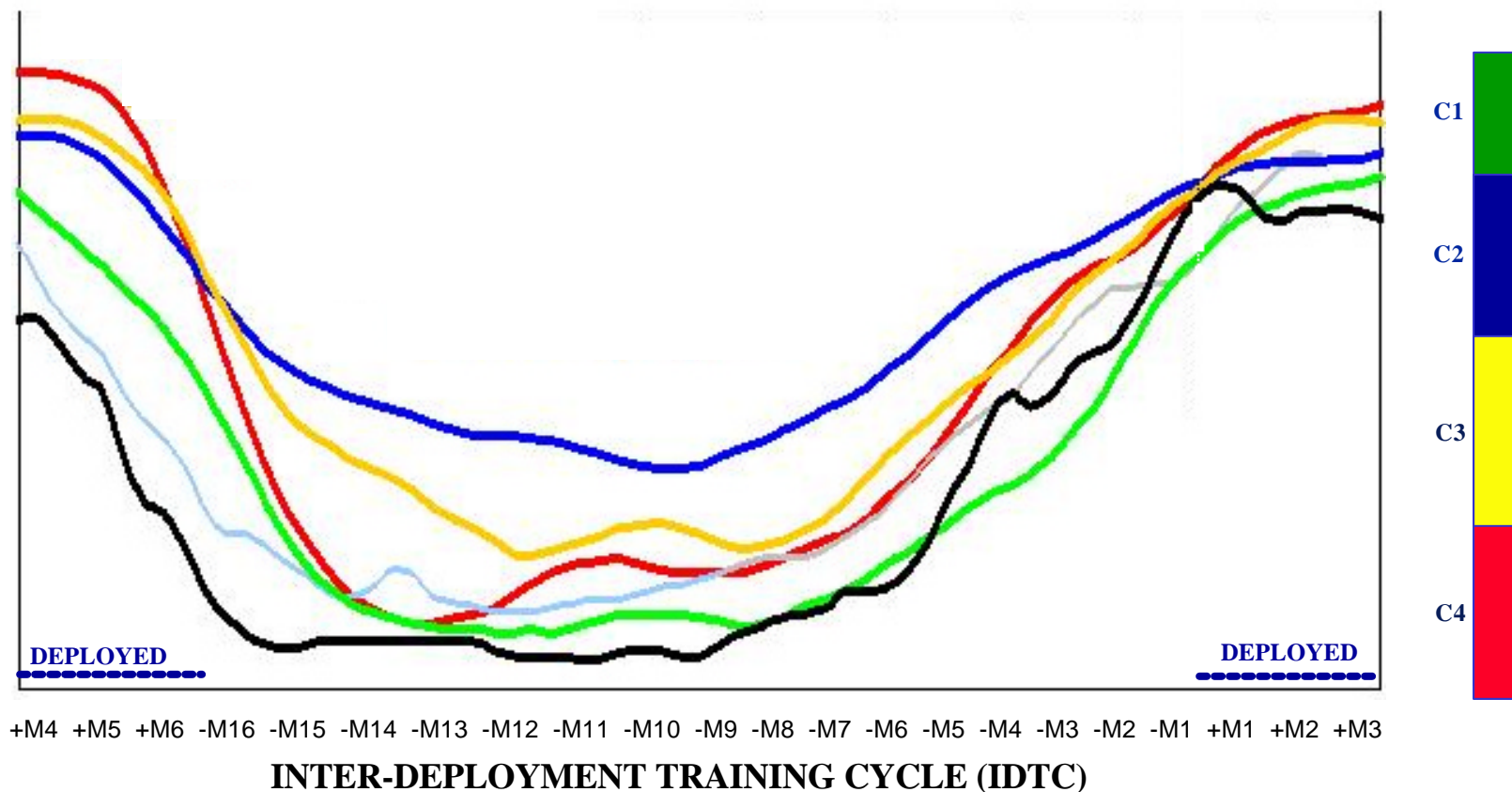
# VAST “At-Sea” Concept



# VAST “In-Port” Concept



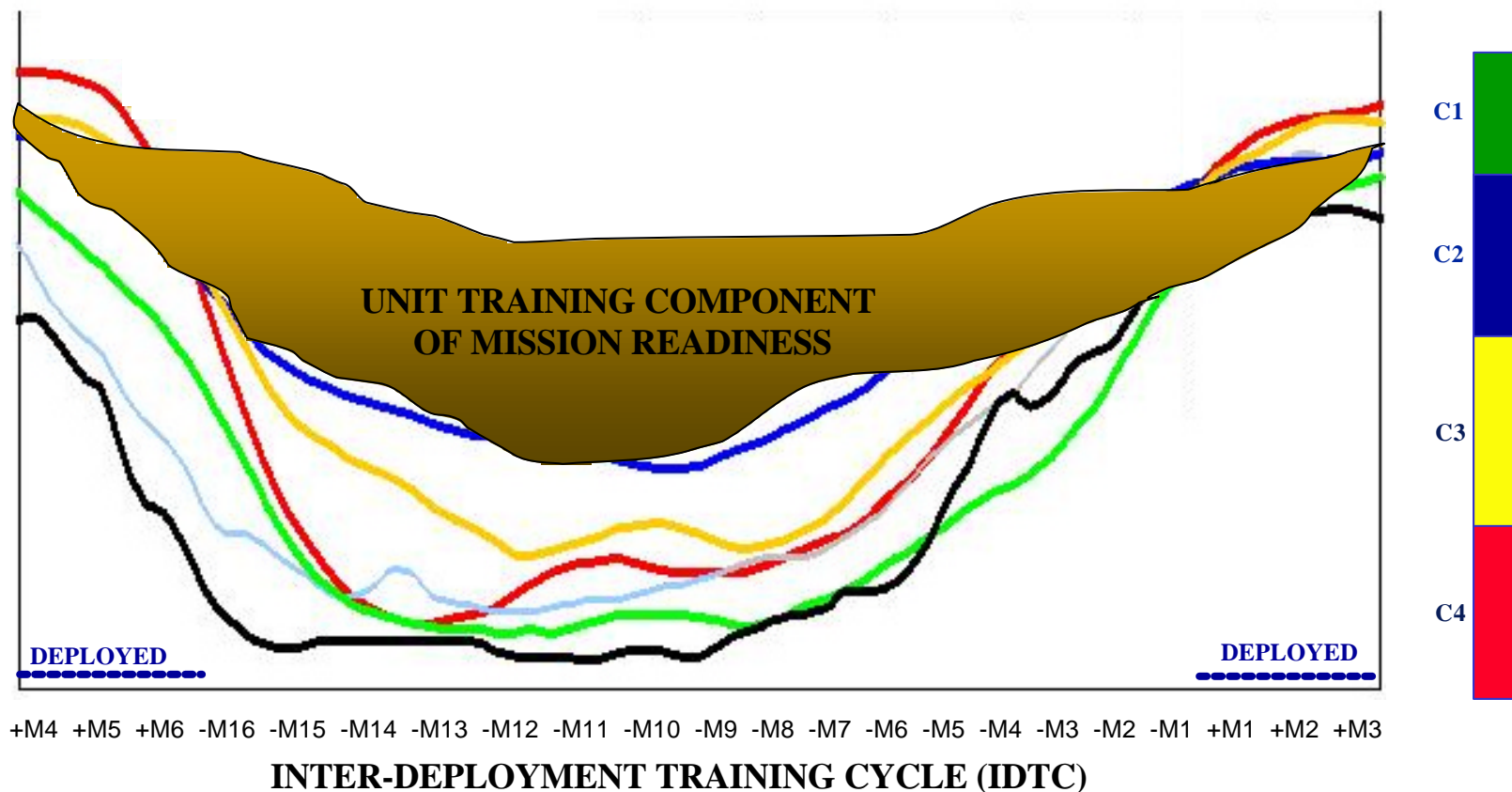
# MISSION READINESS OVER THE IDTC



**MISSION READINESS  
COMPRISED OF:**

**Mobility Status    Maintenance Completion Rates    Combat System Certifications**  
**Munitions/Stores/Spares Load    Personnel Manning Levels    Unit Training**

# MISSION READINESS OVER THE IDTC

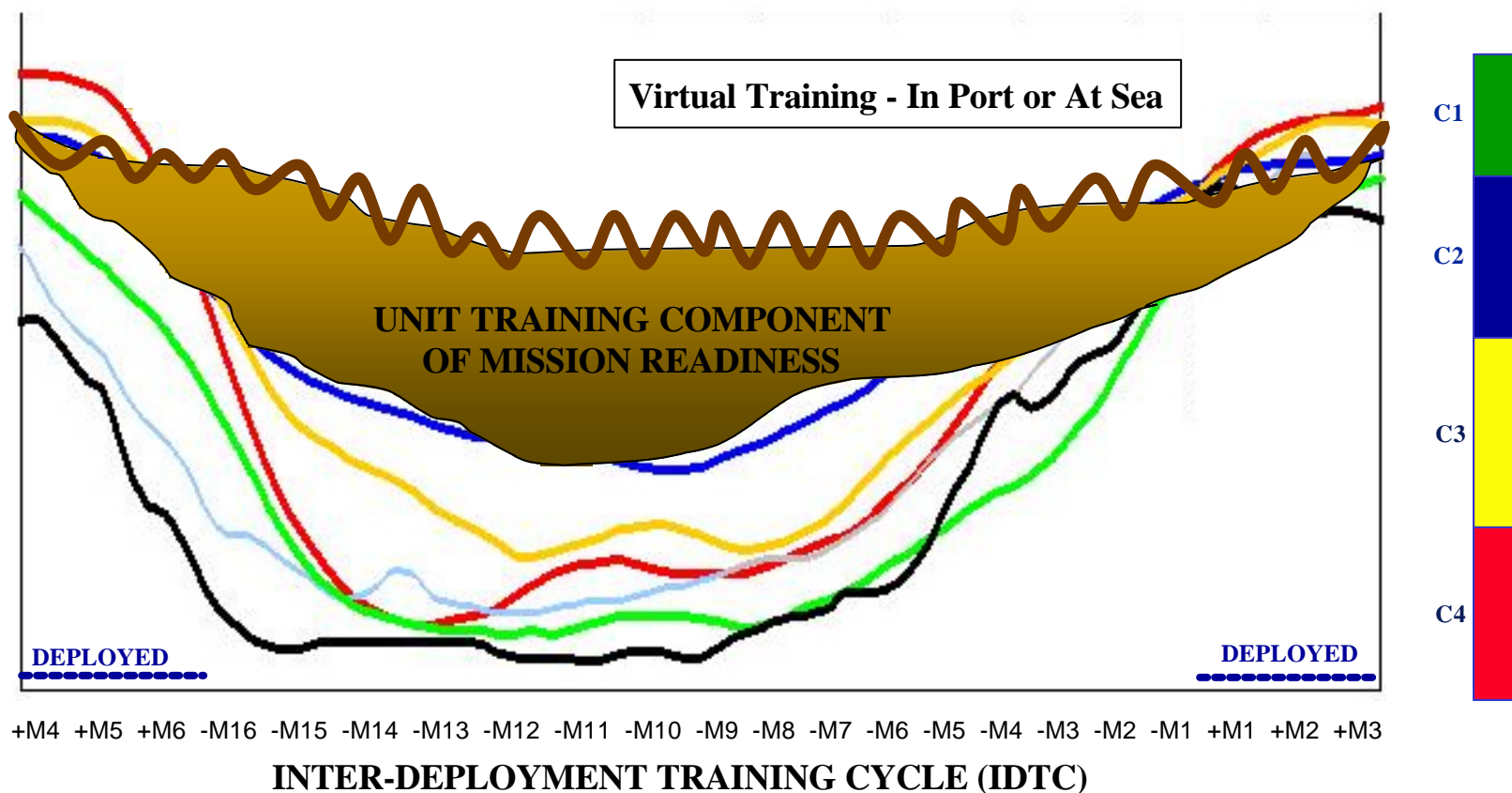


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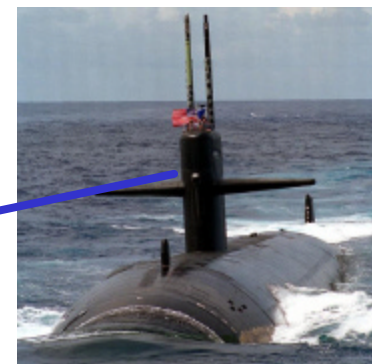
# EFFECT OF VAST ON THE IDTC “BATHTUB”



**Frequent use of constructive training maintains team proficiency and cohesion.  
Combat readiness no longer dependent on underway time and range availability.**

# Concept for the Future: Joint Force Training in Virtual Battlespace

Live Warfighters and Weapons, Mix of  
Live and Synthetic Terrain



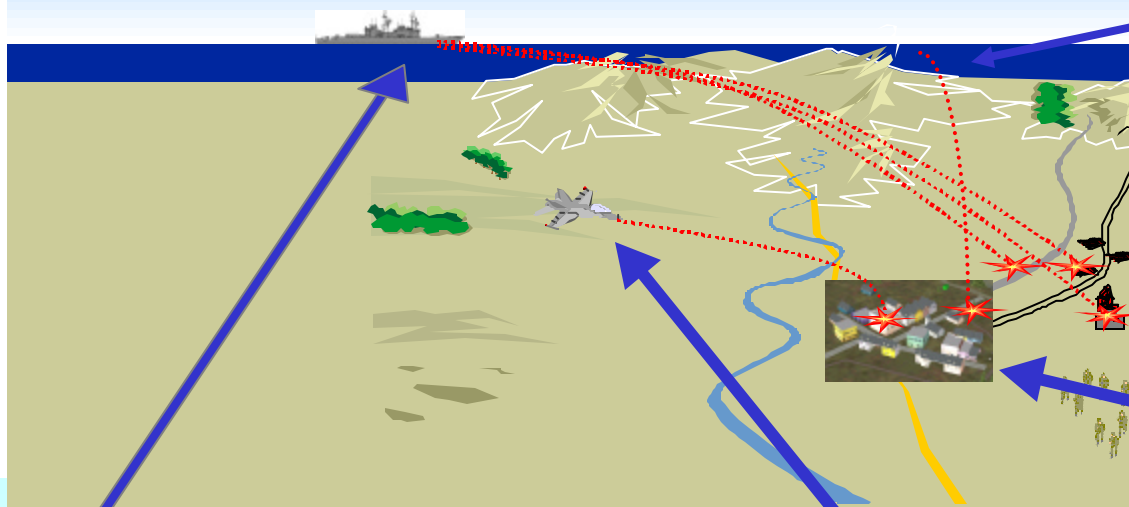
**USW  
Land Attack**



**Joint Urban Ops  
Rehearsal**



**TACAIR  
Mission  
Planning**



**NSFS VAST**  
Naval Surface Fire Support  
Concept Description

